ECO-INNOVATIONS FOR ECONOMIC GROWTH AND ENVIRONMENT PROTECTION

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Abstract

The aim of this work is the presentation of current EU issues on eco-innovations in the light of its role for economic growth and natural environment protection. Within the EU economic and environmental climate, eco-innovations can be the key to Europe's competitiveness in the future. However, in many EU countries, including Poland, the market of eco-innovations is developing too sluggishly and faces a number of obstacles. Moreover, there are many differences between the EU countries in the field of eco-innovations. Although at the European level numerous support tools are currently applied, there is a growing necessity to gear them towards making eco-innovations commonplace on the market.

This paper makes an attempt at answering a few questions crucial for finding optimal solutions for the development of an integrated support system for ecological innovations, in particular: what are the potential benefits of the implementation and development of innovations for the economy and natural environment, what are the current eco-innovation support tools and the main issues in their development, and what is the level of eco-innovation in the EU countries including Poland, seen through the available data.

Key words: Eco-innovations

Introduction

Eco-innovations are one of the elements of the current EU innovation policy, whose environmental aspect has been increasingly important in the EU economy in accordance with the principles of balanced development [EC, 2011a].

The literature on the subject offers many definitions of ecological innovations, also called eco-innovations, which encompass all innovation solutions utilised to protect the environment and human health. These include products, production processes, services, technologies as well as innovative methods of marketing and management whose main objective is to reduce the negative impact on the natural environment. Eco-innovations refer also to building pro-ecological consumer attitudes, support for environmental friendly products and expansion of markets for ecological

products. By eco-innovations one can also understand even slight improvements, but the most important is their contribution to the implementation of balanced solutions whose aim is more effective application of natural resources, reducing any harmful influence on the environment while maintaining a high level of innovation [Szpor, Śniegocki, 2012; Woźniak et al., 2010b].

The term ecological innovations is often linked to the term environmental technologies, so called eco-technologies and pro-environmental technologies of balanced development. However, the implementation of ecological solutions through process or product is also significant as eco-innovation products are mostly fully biodegradable, posing no harm to the environment and human health. Every type of eco-innovation contributes to the reduction or substantial elimination of the anthropogenic burden and curbing the usage of significant natural resources, especially non-renewable ones, e.g. energy resources. As it is put in the EU strategy on the natural environment [EC, 2012c], in the search for ecological innovation solutions it is worth copying nature, utilising natural solutions occurring in the natural environment.

The discussion on eco-innovation should also consider both economic and ecological aspects as the necessity to limit harmful impacts of industrial processes on the environment seems as crucial as the reasonable and balanced utilisation of natural resources [EIO, 2012]. One should also stress that both aspects of eco-innovations are equally important, as they perform an important role in mitigating the effects of harmful changes triggered by man in the natural environment and in economic systems [EC, 2012c].

Eco-innovations are strongly linked to the methods of using natural resources and the ways of production and consumption, therefore the expected benefits for the environment, society and trade stemming from extensive implementation of eco-innovations may bear significant results for the future [EC, 2011a]. Most importantly further development of eco-innovations may result in a lesser impact on the environment and better resilience of the whole economy, beneficial for companies and society in general [Woźniak et al., 2012a; 2012b].

The eco-innovation operations of companies value all initiatives, such as systematic ecological education of the workforce, limiting the use of natural resources by e.g. saving water and electric energy as well as segregating waste. The implementation of the ISO 14001 norm on environmental management may serve as a good example or even

purchase of office paper saving devices. Undoubtedly, such activities have an important impact on reducing company costs [Leszczyńska 2011].

According to the main EU strategic documents such as the strategy 'Europe 2020', the priority of 'smart development' or the initiative 'Innovation Union', eco-innovations remain one of the most vital factors in competitiveness growth and EU socio-economic development in the nearest future. This direction of EU development policy is clearly supported in the face of growing competition from developing countries and maintaining the competitiveness of European companies and regions should be based on the implementation of improved, innovative products, manufacturing and organisational processes. Unfortunately, the economic climate in the EU is currently unsatisfactory and, against previous prognoses, the chances of overcoming the crisis by the end of 2013 are minuscule[42]. Therefore, the analysis of EU economic growth shows that among the main priorities for the nearest future are promotion of competitiveness and eco-innovations as factors particularly effective in the stimulation of the economy and the key to the future competitiveness of Europe, according to the European Commission[43].

Support instruments for eco-innovations

For a number of years now many valuable initiatives have been undertaken supporting balanced eco-innovation development on the EU level. The European Commission provides effective backing to research and demonstration projects in the area of eco-innovations and market acceptance through several programmes [Lipińska 2013; Szpor, 2012]. Particular attention should be drawn to the *Competitiveness and Innovation Framework Programme 20072013 (CIP)*, which is the tool prepared by the European Commission to implement the Lisbon Strategy. The agenda of the programme is to support innovation (including eco-innovations), to improve access to funding and the facilitating of business support services in EU regions. For the 2008-2013 CIP the EU designated nearly 195 billion Euro for funding projects promoting ecological innovations in Europe [44].

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[42] O. Rehn, European Commission Vice-President and Commissioner for Economic and Monetary Affairs and the Euro, speech dated 22 Feb. 2013,http://pl.euronews.com/2013/02/22/wzrost-gospodarczy-w-unii-nie-w-tym-roku/ [access: May 2014]

[43] *Ekoinnowacje, klucz do przyszłej konkurencyjności Europy* [online] http://ec.europa.eu/environment/pubs/pdf/factsheets/ecoinnovation/pl.pdf [access: 15 Nov. 2013]

[44] For details see: http://ec.europa.eu/cip/index_en.htm

One of the three specific CIP programmes, *Entrepreneurship and Innovation Programme (EIP),* focussing on entrepreneurship, small and medium-size companies, competitiveness and innovation [EC, 2012a]. Eco-innovations are one of the main topics of *CIP EIP Non-financing Instruments*. The aim of this initiative is to support the implementation of innovative products, processes and services geared towards the reduction of harmful impacts on the environment, pollution prevention, and support of eco-innovations that promote more effective and responsible natural resource applications [45].

Through the *CIP Innovations* selection processes entrepreneurs can apply for funding for so called pilot projects or projects that commercialised eco-innovative techniques, products and processes which succeeded at the demonstration stage but due to the huge risk were not introduced the market. The support of such promising innovative eco-technologies contributes to erasing obstacles in the development and widespread application of eco-innovations, creates or expands markets for new products or improves EU companies' competitive advantages on the world's markets. Priority was given to the sectors which have significant innovation potential for limiting any impact on the environment. The areas which receive this funding change annually depending on the results of the previous selection processes and project results. So far the CIP EIP priorities include[46]:

1. Material recycling – all activities geared towards the improvement of the waste sorting process, strengthening competitive advantage of recycling companies, creating new solutions in the fields of recycling and innovative products using recycled materials.
2. Buildings and constructions, namely innovative products for the construction sector, sustainable materials and techniques, better utilisation of recycled materials and renewable resources in construction as well as new technologies for purification and water saving.
3. Food and drink sector refers to creating 'greener' manufacturing and packaging processes, more efficient water management processes, innovations in limiting industrial waste, recycling and reclaiming materials, and methods of more effective utilisation of resources. Recently priority was given to sectors which have a significant impact on the environment, such as the milk and meat processing industries

[45] For details see: http://ec.europa.eu/cip/eip/index_en.htm
[46] For details see: http://ec.europa.eu/environment/eco-innovation/about/index_en.htm

4. Greening business and purchasing are the areas ensuring that companies acquiring products are guided by environmental protection. This includes: effective utilisation of resources, aid provided for companies in process and product adjustment to the requirements of environmental protection and promotion of the widespread inclusion of ecological innovations in the supply chain.

So far there have been five rounds of applications in *CIP Eco-innovations* selection processes. The most important data on the selection processes, conducted between 2008 and 2012, is presented in Table 1.

Table 1. *CIP Eco-innovation* selection processes comparison between 2008 - 2012

	2008	**2009**	**2010**	**2011**	**2012**
Number of proposals	134	202	287	279	284
Number of participants	444	614	895	860	916
Requested funding (M€)	110	150	264	199	196
Average requested funding (k€)	830	770	921	712	690
Participation of SME (%)	74	70	66	67	67

Source: *First overview of the Call 2012 CIP Eco-Innovation, First application and market replication projects EACI, Unit 3: Eco-Innovation - Market Replication*, EC, Brussels, 2012.

The number of proposers increases annually with a comparable number of applications in the last three years. However, since 2010, the proposed sum has been on the decrease. One should pay attention to the fact that SME have a relatively high share of the process selection, which proves that they drive eco-innovation [EC, 2012b].

While discussing the support instruments for eco-innovations, we should also mention the European Innovation Partnerships (EIP) incorporated in the leading initiative of 'Innovation Union'. The aim of the EIP is gathering companies and resources around the common objectives of acceleration of breakthrough innovations which will solve specific social problems where the market potential is high for EU companies. Effective resource management is the priority, particularly in the fields of raw materials, sustainable agriculture and water management. Due to the fact that eco-innovations are geared towards the economy effectively utilizing its resources, it remains an EIP support instrument (EC *Eco-innovation Action Plan* (Eco-AP), based on the experiences of ETAP action plans since 2004, proposed that EU countries participate in non–compulsory national plans

on eco-innovations, whose aim is to identify an effective policy to foster the EU countries' policy exchange and to work out favorable implementation conditions for eco-innovations to flourish. These action plans will use the existing initiatives of ecological technology support, but will focus to a greater degree on eco-innovations, both in the private and public sectors and adhere to the global objectives in the area of sustainable development. The initiative of identifying best practice in eco-innovations will also be strengthened[47] in order to propagate more successfully good practice among EU countires [EC, 2011a].

Among the Polish support instruments *GreenEvo-Green Technologies Accelerator* should be pointed to. It is the Ministry for Environment's own project supporting Polish eco-innovators, whose aim is to promote Polish green technologies in foreign markets and their export support. These companies can also participate in foreign trade missions and receive funding from the export support resources. This programme has turned out to be a success. In 2012, the fourth edition of *GreenEvo* took place and 14 companies[48] were selected for the programme.

Other significant Polish initiatives include:

1. Gekon programme – Generator of Ecological Concepts which focuses on various initiatives supported by Polish research institutions and provides backing in technology development for environmental friendly companies. Projects are evaluated according to five categories dedicated to environmental protection, among others, recycling, energy effectiveness and water protection[49].
2. The establishment of several eco-innovation orientated clusters.
3. Polish participation in Environmental Technology Verification (ETV) - a pilot programme of the European Union supporting propagation of eco-innovative technologies[50] .

Since 2014, all demonstration projects and projects implementing technological and social innovations, including eco-innovation, will receive further support from the EU's 'Horizon 2020' programme. The main objective of this programme is to increase EU competitiveness though the implementation of a several specific objectives, among which it is worth paying attention to: the strengthening of EU standing in the areas

[47]See the EU funded project: *Polityka w zakresie przyśpieszania ekoinnowacji,* http://www.ecopol-project.eu/

[48] For details see: www.mos.gov.pl

[49] For details see: http://program-gekon.pl/

[50] For details see: http://www.mos.gov.pl/artykul/4676_czym_jest_etv/17954_czym_jest_etv.html

of research, innovations and technologies, as well as an increase in all forms of innovation, including eco-innovations [EC, 2011b].

A valuable EU initiative supporting SME in the future is the *Programme for the Competitiveness of Enterprises and SMEs (COSME) 20014-2020*, which will continue the actions of CIP from 1st January 2014. The designated budget is 2.5 billion Euros and its main objective is to counteract the most serious market weaknesses hampering enterprise growth, in SMEs in particular[51] [EC, 2011e].

EU innovation and Poland

There is no eco-innovation without innovation, therefore we should invest in eco-innovation along with laying foundations for overall innovation potential [Bukowski et al., 2012a; 2012b]. It is worth pondering what the shape of innovation in the EU member states is, in Poland particularly.

It is generally viewed that Europe is still insufficiently innovative and Poland is in last place both on the innovation and eco-innovations ranking. Based on the statistical data of the latest EU reports and primarily according to the Innovation Union Scoreboard published by the European Commission in March 2013 [IUS 2013], there is steady but slow progress in innovation performance in the EU, despite the continuing economic crisis [EC, 2013a].

The Scoreboard shows average innovation performance measured using composite indicators grouped into three categories and eight areas. The first index category includes so called 'basic conditions' that foster innovation implementation: human resources, open, ideal and attractive research systems, funding and support. The second category refers to company operations and reflects the efforts of European enterprises towards innovation, including investment, networking and entrepreneurship as well as intellectual assets. The third concentrates on indices of 'products' which show how innovations translate into benefits for the whole economy. Innovation leaders and economic results, including employment, are the specific indices in this category [EC, 2013a].

The IUS 2013 and a complementary report to the Scoreboard conclude that the majority of the EU member states improved their innovation performance. However, there are still countries, from Central and Eastern Europe in particular, which do not concentrate sufficient efforts in order to boost their performance to bridge the gap, which widens year on year, as is the case in Poland. The differences in the results between the

[51] For details see: http://ec.europa.eu/cip/cosme/index_en.htm

states are substantial and the innovation gap between the member states is growing. The authors of the report claim that the negative innovation results were influenced by the continuing economic crisis in the EU, which contributed to the fall in business and venture capital investment over the years 2008-2012 [EC, 2013a; 2013b].

The most innovative countries, which have been the innovation leaders for a number of years, are still improving their performance. As in the 2012 Scoreboard, among the innovation leaders are Sweden (SII equals 0.747), Germany (0.72), Denmark (0.718) and Finland (0.61). These countries show performances above that of the EU average (0.544). In the second group there are innovation followers which show a performance close to that of the EU average: Holland, Luxemburg, Belgium, Great Britain, Austria, Ireland, France, Slovenia, Cyprus and Estonia. The third group consists of moderate innovators: Italy, Spain, Portugal, The Czech Republic, Greece, Slovakia, Hungary, Malta and Lithuania. These are the states that show performances below that of the EU average. The final group consists of modest innovators: Poland (0.27), Latvia (0.225), Rumania (0.221) and Bulgaria (0.188). Among the countries that boosted their innovation performance over the years 2008-2012, expressed by percentage change on the SII index value, are Estonia (7.1%), Lithuania (5.0%), Latvia (4.4%) and Slovenia (4.1%). Poland recorded the very slight growth of 0.4% (EC, 2013a).

Analysing the latest report from the European Commission, *The State of the Innovation Union* [EC, 2013a], it is worth considering the most significant factors stimulating innovations. Undoubtedly SMEs are the main drivers that turn ideas into products and commercial services. These commercialised innovations come through excellent research systems. All the innovation leaders rely on research and development and therefore allocate a very high level of expenditure in these areas and, in support of such national actions towards innovations, companies and universities play the most prominent roles. In addition, it is common for these innovation leaders that their business sectors show a higher level of investment in R&D than in other EU member states. These countries are the main patent applicants and have a highly developed link between universities and industry. For example, while the EU average patent application index stood at 3.9 in 2012, both Finland and Sweden's stood at 8.93, Germany-7.42 and Denmark-7.04. Poland scored as low as 0.45, Bulgaria-0.34, Lithuania-0.31 and Romania only 0.18 [EC, 2013a].

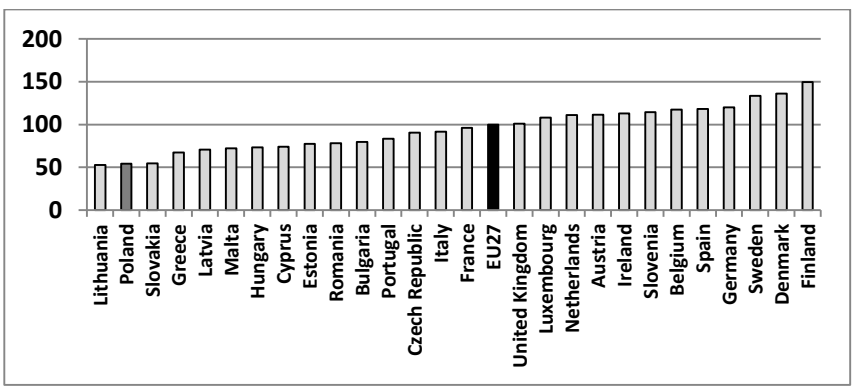
The Scoreboard therefore points to the fact that Poland is among the least innovative EU countries. Furthermore, 2012 saw regression

in reference to 2011 (a fall from 23rd position to 24th) [EC, 2013a]. The lowest scores are recorded in the areas of cooperation between science and business, the number of innovators, quality, openness and excellence of research systems. The results of funding and support, namely public and private expenditure on R&D [Zadura-Lichota 2013] are still deeply unsatisfactory.

Analysis of the EU's and Poland's eco-innovation potential

The low scores in innovation potential of Poland translate into very poor results in the area if eco-innovation. According to the annual report of the *Eco-innovation Observatory* (EIO), Poland took the second last position in the eco-innovation ranking across EU member states for 2012, slightly improving its result from 2011 when it bottomed the list. [EIO 2012; EIO 2013].

In order to compare overall eco-innovations across EU member states, one composite index was constructed (SEI) comparing the results to the mean of 100 for EU27. The results for 2012 are presented in Graph 1.



Graph 1. Overall eco-innovation results for the EU states in 2012
Source: Own work based on EIO, 2013.

Lithuania, Poland, Slovakia, Greece, Latvia, Malta, Hungary, Cyprus, Estonia, Rumania, Bulgaria, Portugal, The Czech Republic, Italy, France, the EU, Great Britain, Luxemburg, Holland, Austria, Ireland, Slovenia, Belgium, Spain, Germany, Sweden, Denmark, Finland

In 2012, 12 of the EU states scored above the EU average, however 15 counties performed below the average. Eco-innovation leaders include Finland (SEI index 149.8), Denmark and Sweden. It should be highlighted

that these countries are innovation leaders in the field of overall innovation in the 2013 IUS ranking. The fourth position taken by Germany (overall index 120) fully confirms the rule that a high level of innovation boosts eco-innovations. Germany tops the list of the second group of six countries of innovation followers, performing well. There are also six other countries which score at a medium level, Holland being their leader reaching 111.2. However Poland finds itself second last among the countries trying to close the gap with an index of 54.4, nearly three times lower than Finland.

The EU Eco-innovation Scoreboard (EIS) is an important tool which assesses and compares comprehensively the eco-innovation results of the EU member states. The overall eco-innovation index was calculated on the basis of sixteen indicators from eight different databases grouped in five areas:

1. Eco-innovation input, focusing on financial backing for eco-innovations as a percentage of GDP, the value of 'green investment' and scientific personnel in eco-innovations.
2. Eco-innovation activities, firms having implemented eco-innovations and environmental management systems.
3. Eco-innovation output, e.g. patents.
4. Environmental outcomes, namely consumption of water, material, energy and gas emission.
5. Socio-economic outcomes, which include employment in eco-industries (% of total workforce), eco-innovation market size, exports of products from eco-industries (% of total exports).

The score of the EU-27 member states in the five areas of eco-innovations over the years 2010-2012 is presented in Tables 2 and 3. Based on the data included in the tables, we can conclude that on the evidence of eco-innovation activities, Poland came last in environmental and socio-economic outcomes, taking 23rd place and 22nd in eco-innovation input and output. It is worth noting that in 2012, in comparison to the previous years, there was a slight improvement in the areas of eco-innovation activities and output, however, at the same time a slight fall in input, environmental and socio-economic outcomes.

Analysing Poland's scores in the area of overall eco-innovation, the situation is critical and the gap between the country and the EU leaders is huge. One may ask the question whether there is any possibility to bridge this gap and improve the situation.

Table 2. Comparison of eco-innovation performance across the EU-27 Member States in the areas of eco-innovation activities and input over the years 2010-2012

Country	Eco-innovation activities			Eco-innovation input		
	2010	**2011**	**2012**	**2010**	**2011**	**2012**
EU27	100	100	100	100	100	100
Austria	183	101	104	81	80	79
Belgium	69	90	88	135	144	142
Bulgaria	12	41	50	36	21	20
Cyprus	20	62	63	22	22	14
Czech Republic	70	171	167	73	80	69
Denmark	223	107	98	176	184	191
Estonia	60	95	96	77	67	94
Finland	105	125	120	288	272	279
France	47	83	83	108	96	115
Greece	64	25	27	45	n/a	n/a
Spain	258	224	215	123	120	102
Holland	30	58	58	100	101	97
Ireland	62	109	108	219	211	210
Lithuania	29	75	80	42	34	25
Luxemburg	45	95	79	76	81	74
Latvia	38	39	45	37	50	30
Malta	44	53	53	22	29	20
Germany	194	125	123	115	129	125
Poland	**23**	**41**	**41**	**33**	**32**	**25**
Portugal	109	122	124	64	62	71
Romania	35	118	114	48	42	40
Slovakia	30	67	75	36	35	34
Slovenia	6	119	105	55	68	55
Sweden	92	156	152	196	213	204
Hungary	39	82	80	50	49	34

Great Britain	14	110	125	119	135	124
Italy	104	88	89	90	73	79

Source: Own work based on EIO, 2013.

Table 3. Comparison of eco-innovation performance across the EU-27 Member States in the areas of output, environmental and socio-economic outcomes over the years 2010-2012

Country	Eco-innovation output			Environmental outcomes			Socio-economic outcomes		
	2010	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
EU27	100	100	100	100	100	100	100	100	100
Austria	258	223	168	114	114	106	138	112	102
Belgium	153	101	117	96	95	91	131	153	159
Bulgaria	n/a	37	98	43	47	46	167	193	195
Cyprus	116	86	107	73	74	67	99	111	121
Czech Republic	51	17	23	67	68	65	77	129	135
Denmark	245	182	171	110	109	108	137	98	96
Estonia	n/a	63	69	48	52	49	59	92	90
Finland	205	186	196	78	77	76	119	106	103
France	89	119	89	114	111	110	112	83	79
Greece	10	69	92	89	88	88	34	43	51
Spain	18	144	120	98	101	103	77	127	120
Holland	252	112	124	146	139	131	92	123	142
Ireland	35	159	128	91	86	99	38	26	24
Lithuania	4	23	23	74	70	75	46	54	54
Luxemburg	142	240	143	148	145	138	73	89	98
Latvia	7	95	97	86	82	66	82	119	117
Malta	n/a	117	97	131	132	123	45	14	7
Germany	245	160	155	111	110	108	121	95	93
Poland	**9**	**23**	**52**	**64**	**66**	**61**	**83**	**84**	**81**
Portugal	14	63	72	87	86	86	59	72	64

Romania	1	41	101	56	59	60	98	78	81
Slovakia	n/a	12	30	81	85	74	43	61	53
Slovenia	n/a	58	103	73	74	76	143	233	241
Sweden	233	187	177	122	108	105	90	56	39
Hungary	58	58	52	99	99	75	77	120	125
Great Britain	70	73	71	137	136	131	83	63	60
Italy	72	63	71	110	113	110	96	106	104

Source: Own work based on EIO, 2013.

It seems that Polish innovation will be able to improve, but immediate action must be carries out, most of all in the attitude towards development policy at governmental level. Policy and public actions must facilitate eco-innovation in Poland starting from today [Bukowski et al., 2012b]. Poland's low score may stem from flaws in the eco-innovation development support system. On an optimistic note, Poland is capable of competing in eco-innovations immediately, at least through implementing pro-innovation reforms and ensuring adequate funding of eco-innovative initiatives, for SMEs in particular.

To sum up the analysis of eco-innovation performance in the EU member states, one will come to the conclusion that through its report the European Commission points to the directions and solutions for future sustainable eco-innovation development across all the UE states [EIO, 2013]. The authors of the report agree unanimously that a strategic partnership between decision-makers, companies, citizens and scientific personnel is necessary to identify the actions needed in order to boost the role of ecological innovations in the transfer towards an ecological economy, also called a 'green' economy.

Eco-innovation development barriers

The studies conducted in the EU countries in 2011 on the approach of European entrepreneurs towards eco-innovations [EC, 2011c] pointed to the fact that the majority of countries, including Poland, see a slow and hesitant development of the eco-innovation market. Despite some positive indicators on eco-innovation initiative development, there are still a number of barriers. This situation mainly occurs in the new member states.

The two main barriers hampering eco-innovations are uncertain market demand and investment return. Other significant obstacles include: the lack of acceptable environmental benefits and their costs set against

market prices, funding limitations, rigid economic structures, barriers linked to infrastructure and behaviour patterns, perverse incentives and subsidies. It is worth mentioning that entrepreneurs frequently do not possess sufficient knowledge on the benefits and effective ways of eco-innovation implementation. Awareness of the advantages of ecological innovative technology implementation among entrepreneurs and consumers in Poland is relatively low compared to the eco-innovation leading countries [EC, 2011a; EC, 2011c].

Ecological innovations are still perceived as mostly 'end-of-pipe' innovations or environment protection technologies. Entrepreneurs are very cautious about the low-emission economy concept, unwilling to implement rigorous environmental protection laws, often regarded as an extra cost. Investing in cheaper technologies and the unwillingness to establish cooperation with R&D institutes are also significant barriers in eco-innovation implementation in companies [EC, 2011c; Szpor, 2012].

Unfortunately, Poland lacks an integrated system of ecological innovation support and although recently there have been strategic declarations at the governmental level, many areas of public policy still suffer from a lack of decisive actions. Today Poland needs a long-term strategy on eco-innovations, based on partnership as well as more overall national interest and engagement as numerous issues and barriers significantly hamper eco-innovation performance. The creation of clusters brings hope for the future and the increasing support of some institutions, e.g. the National Research and Development Centre and the National Fund for Environmental Protection and Water Management, given through programmes promoting mainly innovative pro-ecological technologies (e.g. see the above mentioned Gekon). Therefore, it is justified to say that Poland is capable of accelerating eco-innovation development mainly through adequately geared policies and actions, allocating extra funds for investment in the area of eco-innovations as well as the implementation of the right risk reducing tools for entrepreneurs and investors.

Summary

The last decade has seen steady, consistent growth in interest on eco-innovations at the European level. The most significant reasons for eco-innovation development undoubtedly include the occurrence of climate change, global competitiveness growth and exhaustion of natural resources.

Eco-innovations, which have huge potential, are definitely the answer to the challenges of today's EU economy, particularly in the area of competitiveness growth. Where business and environment go together,

there is always a place for eco-innovations as they are beneficial both for the economy and the environment.

Ecological innovations top the EU innovation policy list of priorities in the 2020 framework, which is why the EU applies various types of eco-innovation support instruments. However, this backing is still not sufficient as apart from adequate financial incentives there is a call for a more coordinated approach of institutions engaged in the innovation sector development, scientific research and environmental protection. Eco-innovation applications run by The European Commission within the *COSME* programme should continue in the new financial framework as they successfully contributed to the implementation and propagation of eco-innovative projects across the EU.

Based on IUS and EIO statistics, one can conclude that there are significant divergences in the areas of innovation and eco-innovation performance among EU member states. The Polish economy, like the economies of other new member states, still shows a low interest in innovation thus eco-innovations. In order to catch up with innovation leaders Poland must put more emphasis on innovative economy promotion. Engagement on the national level seems vital. Policy and public action must foster eco-innovation and the implementation of such actions should be commenced immediately.

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